

REMARKS

The application has been amended and is believed to be in condition for allowance.

The claims have been amended responsive to the claim objections. Note that claim 1 now recites "said network of tubes being an integral part of an outer wall (9) of the thermal system to be cooled;" to establish antecedent basis for "the outer wall" in claims 3-4.

Rejections Under 35 USC 103

Claims 1, 3-9 were rejected under section 103 as obvious over ARTHUR 5,115,184 in view of HEGGART 4,813,055.

Claim 2 was rejected in further view of METALMANN 4,789,991.

The rejections are respectfully traversed.

The Official Action acknowledges that ARTHUR does not teach:

adjustable-flow cocks (2) controllable for controlling the atomizing of the cooling water during the spraying (claim 1);

another system configured for maintaining the negative pressure within the water spraying zone delimited by said respective inner and outer walls (claim 1);

wherein the negative pressure is maintained for an evaporation of the sprayed cooling water at a low temperature (claim 1);

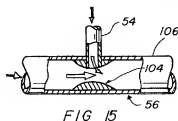
the system for maintaining the negative pressure with the water spraying zone (6) comprising a steam-extraction system (10) that extracts steam produced within the water spraying zone (claims 8-9, 14-15).

The Official Action argues that adjustable-flow cocks (2) controllable for controlling the atomizing of the cooling water during the spraying (claim 1) would be obvious as being within the general skill of the art.

HEGGART is offered for the remaining missing features.

The HEGGART Abstract discloses: A spray cooling system for cooling a furnace with spray headers and pipes (14, 16, 18) that supply coolant to spray nozzles (70) distributed within a coolant space in a roof structure (10) to spray coolant against the working plates (22) of the roof. A pump (56) is connected to evacuate the coolant from the coolant space. A substantial portion of the sprayed droplets are vaporized during cooling whereby the latent heat of vaporization of the coolant is utilized to provide a significantly increased cooling rate.

The pump is illustrated in Figure 15, reproduced below.



The Examiner correctly identifies column 7, beginning at line 36 as being relevant to the pump and condensation extraction.

HEGGART discloses that the pump means 56 may comprise a venturi 104 in pipe 106, which pipe conveys waste water away from another area of the furnace. The outlet pipes 54 lead to the venturi, whereby when water is flowing through pipe 106, a low pressure is created in pipe 54, evacuating coolant from the coolant space.

Beginning at line 42, it is explained that the coolant water sprayed from the nozzles 40 forms small droplets, which provide a very large surface area to enhance cooling. Moreover, in the event that the droplets of cooling water do flash to steam, there is no danger of over-pressurization and explosion. Evacuation of the water from the coolant space insures against the build-up of liquid coolant in the coolant space, and maintains a low pressure therein, whereby the chance of coolant leaking into the furnace is extremely remote.

HEGGART claim 1 mentions the pump removing fluid coolant to prevent undesired buildup of pressure. See also claim 4. See that claims 2, 5 expressly state that the fluid coolant is sprayed with a volume and pressure to maintain the water in the form of small droplets.

Column 3, lines 56-59 disclose the HEGGART system as being under pressure, albeit a lower pressure than the prior art systems, i.e., "Moreover, the system of the invention is only

under sufficient pressure to effect a spray, and access to the cooling space or plates is convenient, enabling easy cleaning or repair when necessary." See also column 4, lines 1-3.

Again, column 7 discloses that that the pump means 56 may comprise a venturi 104 in pipe 106 whereby when water is flowing through pipe 106, a low pressure is created in pipe 54, evacuating coolant from the coolant space.

In summary, HEGGART teaches a system at a lower pressure than the prior art high pressure systems, and a venturi that creates a local low pressure to evacuate coolant from the coolant space.

The Official Action is factually in error in that HEGGART does not teach another system configured for maintaining the negative pressure within the water spraying zone delimited by said respective inner and outer walls (claim 1). The low pressure of HEGGART is not a negative pressure.

The Official Action is factually in error in that HEGGART does not teach wherein the negative pressure is maintained for an evaporation of the sprayed cooling water at a low temperature (claim 1). Rather, HEGGART teaches providing small droplets to provide a large surface area to enhance cooling (column 7, lines 42-44). HEGGART recognizes that "in the event that the droplets of cooling water do flash to steam, there is no danger of over-pressurization and explosion." HEGGART teaches that the evacuation of the water from the coolant space maintains

a safe low pressure condition. HEGGART clearly make no teaching to encourage the evaporation of the sprayed coolant.

The Official Action is factually in error in that HEGGART does not teach the system for maintaining the negative pressure with the water spraying zone (6) comprising a steam-extraction system (10) that extracts steam produced within the water spraying zone (claims 8-9, 14-15). HEGGART extracts coolant not steam.

Claim 8 requires "the system for maintaining the negative pressure with the water spraying zone (6) comprises a steam-extraction system (10) that extracts steam produced within the water spraying zone". This is not disclosed.

Claim 9 requires "the steam-extracting system (10) is comprised of a compressor to compress said extracted steam and inject the compressed steam into a dedicated exchanger unit so that said compressed steam acquires a temperature and a pressure suitable for power co-generation". The Examiner states that pump 56 is a compressor. Pump 56 is not a compressor. Also note that requirement of the compressed steam acquiring a temperature and pressure suitable for power co-generation. This is also not disclosed.

Claim 14 further requires "the system for maintaining the negative pressure within the water spraying zone (6) comprises a steam-extraction system (10) located in a vertically uppermost part of the water spraying zone and extracts steam from

the upper part of the water spraying zone,". Pump 56 is clearly not in an uppermost part of the water spraying zone and clearly does not extract steam from the upper part of the water spraying zone.

As HEGGART does not disclose the features for which it was offered, the rejection fails, apart from the issue of whether the modifications suggested by the Examiner are indeed well motivated.

The other claims are allowable at least for depending from an allowable claim.

In summary, the presently presented claims are believed to be both novel and non-obvious over the prior art in general and over the applied references in particular. Therefore, reconsideration and allowance of all the claims are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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